

A radio terminalBackground of the invention

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The present invention relates to a terminal and a method thereto for displaying information on a small display.

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Some handheld devices, such as personal digital assistants (PDA), cellular phones, pagers as well as desk-top telephones, are capable of receiving and displaying different kind of information. This information is typically elements comprising a text based on alpha-numerical signs, but the elements can also comprise graphics. However, these types of devices uses a display of rather small size, which some users may experience as difficult to monitor. The difficulty lays often in how the information is presented on the display, which might differ depending on the information provider and/or the device itself.

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One way of displaying the information would be to wrap a text and feed it vertically down the display, which might be preferable if the text is longer than the width of the display. If the text is longer than what can be continued in the number of lines displayable in the display the text is being clipped vertically, the remaining text can be accessed by scrolling the text downwards. The scrolling could either be done manually, e.g. by pressing on a pre-defined key which activates the scrolling function, or automatically.

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Another way of displaying information could be to display a text which is continuos, i.e. a text which shown on a single line. If the text is longer than the width of the display, the text can be scrolled across the display either manually, e.g. by pressing on a pre-defined key which activates the scrolling function, or automatically.

Also, these two ways of displaying, can be combined dynamically by the provider and/or the manufacturer. Thus, if some parts is considered as easier to monitor when displayed in one way, and vice versa, then the provider and/or the manufacturer can display the information in the preferred way. For example, the elements can be links displayed in a list, which can be scrolled down vertically. In order to do this quickly, it might be preferable to display the list as continuous text. However, if the elements are initially showing the same content on the display, and the remaining parts are not visible, then it might be preferred to wrap the text.

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Here is an example of three elements to be displayed:

<http://wap.nokia.com/club.wml>

<http://wap.nokia.com/stock.wml>

15 <http://wap.nokia.com/net.wml>

Here is an example of how these three elements can be displayed as continuous text, which initially showing the same content on the display:

20 <http://wap.nokia.com/...>

<http://wap.nokia.com/...>

<http://wap.nokia.com/...>

Here is another example of how these three elements can be displayed as wrapped text:

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<http://wap.nokia.com/club.wml>

<http://wap.nokia.com/stock.wml>

30 stock.wml

<http://wap.nokia.com/net.wml>

Both of these two alternatives can be useful depending on what the user would like to do. However, there are very few possibilities for the user to affect the elements. Therefore, there is a need to improve and facilitate the possibilities to display the information on a display.

Summary of the invention

According to one aspect of the present invention there is provided a method for displaying information on a display, where the information is provided with elements. An element is either having a continuous length presenting a length which is equal to or greater than the size of said display, or a wrapped length presenting a length which is less than the size of said display. The display is further provided with a user interface having a menu structure of items. The user interface is provided with a selectable continuous length item and/or a wrapped length item. The information is displayed according to the selection made in the menu structure of the user interface, in order to allow the user to toggle between continuous length and wrapped length.

According to another aspect of the present invention there is provided a terminal for displaying information on a display. The information comprising elements, wherein an element is either provided with a continuous length presenting a length which is equal to or greater than the size of the display, or a wrapped length presenting a length which is less than the size of the display. The terminal comprising a display for displaying the information, and a user interface provided with a menu structure comprising a selectable continuous length item and/or a wrapped length item. The items are arranged to display the information according to a selection made in the menu structure, in order to allow the user to toggle between continuous length and wrapped length.

According to a third aspect of the present invention there is provided a terminal for displaying information on a display. The information comprising elements, wherein an element is either provided with a continuous length presenting a length which is equal to or greater than the size of the display, or
 5 a wrapped length presenting a length which is less than the size of the display. The terminal comprising a display for displaying the information, means for setting a first type of elements to be displayed as a continuous length item and a second type of element to be displayed as a wrapped length item. Also, the terminal comprising means for identifying the first type of
 10 element when acting in a text to be displayed, and means for displaying the first and second type of elements according to their setting.

Brief description of the drawings

15 For a better understanding of the present invention and to understand how the same may be brought into effect reference will now be made by way of example only to the accompanying drawings in which:

Figures 1 and 2 schematically illustrate a radio handset ;

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Figure 3 is a flowchart illustrating one aspect of the present invention; and

Figure 4 illustrates a user interface according to an embodiment of the present invention.

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Fig. 1 shows a preferred embodiment of a terminal, hereafter also referred as a phone, according to a preferred embodiment of the invention. The phone, which is generally designated by 1, comprises a user interface having a keypad 2, a display 3, an on/off button 4, a speaker 5, a microphone 6a and a
 30 transducer 6b. The phone 1 according to the preferred embodiment is adapted for communication via a wireless telecommunication network, e.g. a cellular network. However, the phone could also have been designed for a

cordless network. The keypad 2 has a first group 7 of keys as alphanumeric keys, by means of which the user can enter a telephone number, write a text message (SMS), write a name (associated with the phone number), etc. Each of the twelve alphanumeric keys 7 is provided with a figure "0-9" or a sign "#"
5 or "*", respectively. In alpha mode each key is associated with a number of letters and special signs used in text editing.

The keypad 2 additionally comprises two soft keys 8, two call handling keys 9,
10 and a navigation key 10.

The two soft keys 8 have a functionality corresponding to what is known from the phones Nokia 2110™, Nokia 8110™ and Nokia 3810™. The functionality of the soft key depends on the state of the phone and the navigation in the menu by using a navigation key. The present functionality of the soft keys 8 is
15 shown in separate fields in the display 3 just above the keys 8.

The two call handling keys 9 according to the preferred embodiment are used for establishing a call or a conference call, terminating a call or rejecting an incoming call.

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The navigation key 10 is an up/down key and is placed centrally on the front surface of the phone between the display 3 and the group of alphanumeric keys 7. Hereby the user will be able to control this key by simply pressing the up/down key using his/her thumb. Since many experienced phone users are
25 used to one-hand control, it is a very good solution to place an input key, requiring precise motor movements. Thus, the user may place the phone in the hand between the finger tips and the palm of the hand. Hereby, the thumb is free for inputting information.

The transducer 6b could be a buzzer, and is arranged to generate a sound of a ring tone, upon reception of a signal from another phone, e.g. an incoming call or reception of an SMS (short messaging service) message.

5 Fig. 2 schematically shows the most essential parts of a preferred embodiment of the phone. These parts being essential to understand the invention. The preferred embodiment of the phone of the invention is adapted for use in connection with a GSM network, but, of course, the invention may also be applied in connection with other phone networks, such as other kinds
10 of cellular networks and various forms of cordless phone systems or in dual band phones accessing sets of these systems/networks. The microphone 6a records the user's speech, and the analogue signals formed thereby are A/D converted in an A/D converter (not shown) before the speech is encoded in an audio part 14. The encoded speech signal is transferred to controller
15 means 18, which may support software in the phone. The controller means 18 also forms the interface to the peripheral units of the apparatus, including a RAM memory 17a and a Flash ROM memory 17b, a SIM card 16, the display 3 and the keypad 2 (as well as data, power supply, etc.). The controller means 18 communicates with the transmitter/receiver circuit 19. The audio
20 part 14 speech-decodes the signal, which is transferred from the controller 18 to the earpiece 5 via a D/A converter (not shown).

Also, the audio part 14 is also able to give an output of an ring tone to the buzzer 6b. The ring tone can be stored in either of the memories 17a,b, and is
25 recalled when the receiver 19 receives an incoming signal, by means of the controller 18. Thus, the ring tone is recalled from the memory, forwarded to the audio part 14, and the ring tone is generated as an output from the buzzer 6b.

30 The controller means 18 is connected to the user interface. Thus, it is the controller means 18 which monitors the activity in the phone and controls the display 3 in response thereto.

Therefore, it is the controller means 18 which detects the occurrence of a state change event and changes the state of the phone and thus the display text. A state change event may be caused by the user when he activates the keypad including the navigation key 10, and these type of events are called entry events or user events. However, the network communicating with the phone may also cause a state change event. This type of event and other events beyond the user's control are called non user events. Non user events comprise status change during call set-up, change in battery voltage, change in antenna conditions, message on reception of SMS, etc.

Figure 3 shows a flowchart over a method for displaying information on a display, in accordance with the present invention. The information is provided with elements. An element is either having a continuous length presenting a length which is equal to or greater than the size of the display, or a wrapped length presenting a length which is less than the size of said display. The display is further provided with a user interface having a menu structure of items.

In order to allow the user to toggle between continuous length and wrapped length, the user is first able to select a display menu "SELECT DISPLAY MENU". In this menu, the user interface is provided with a selectable continuous length item and/or a wrapped length item "SELECT AN ITEM". If the present text is set as wrapped text, and the user would like to change it into continuous text, the user would perhaps like to choose the continuous length item, "CONT. OR WRAPPED?". Thereafter, the information is finally displayed according to the selection made in the menu structure of the user interface, which in this case was "DISPLAY TEXT CONTINUOUSLY".

As an alternative solution, in accordance with the present invention, the selection could be done automatically. This is done by providing the terminal with means for setting a first type of elements to be displayed as a continuous

length item and a second type of element to be displayed as a wrapped length item. The terminal also comprising means for identifying the first type of element when acting in a text to be displayed, and means for displaying the first and second type of elements according to their setting.

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With reference to Fig. 4a and 4b, an example is shown on how the display in a user interface can act by interaction of the user according to the present invention. The user interface may comprise the same elements as shown in Fig.1, i.e. a keypad 2, a display 3, an on/off button 4, a speaker 5 and a
 10 microphone 6. Also, it is the control means 18 in Fig. 2 which controls the user interface. Starting from Fig. 4a, there is a layout 30 presented on a display in a phone, as shown in Fig.1 and 2, which indicates signal strength 35 from the wireless telecommunication network "D1 Telekom" 40, the battery power 45 and a clock showing the time 50 in hours and minutes. Preferably, the display
 15 in the phone is an LCD (Liquid Crystal Display) display. The display, can be controlled by the control means 18 as shown in Fig. 2. The layout 30 presents an example of the phone in idle mode, i.e. when the phone is activated and awaiting an action, e.g. an incoming or outgoing call. In the bottom of the display there are two items which are denoted as "Menu" 55 and "Names" 60.
 20 If the user selects "Names" 60 he/she can e.g. access a built in phone book. If the user selects "Menu" 55, he/she can select among several different menus. The actual selection of features in the bottom of the display, like "Menu" and "Names", can be selected by means of the soft keys disclosed with reference to Fig. 1.

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One of the menus can be the next layout 65 called "Browser" 70. If the user chooses to use this menu, he/she can access different telecom related information services, e.g. Internet. One way of accessing this kind of information is to use the Wireless Application Protocol, WAP. The Wireless
 30 Application Protocol (WAP) is a result of continuous work to define an industry wide standard for developing applications over wireless communication networks. WAP is disclosed in the Wireless Application Protocol Architecture

Specification; Version 30-Apr-1998; by Wireless Application Protocol
Architecture Working Group.

If the user chooses to select "Home" 71, this may lead to the next layout 75,
5 which graphically indicates, "Connecting to Service" 80. This shows an
example of how the phone is trying to establish a connection to e.g. Internet,
by sending an access request to a server. If a connection is established,
some kind of welcome text for a home page might be displayed, "Welcome to
D1 Web." 90. If the user selects "Options" 100 a list of selections can be
10 displayed as shown in the following layout 110. For example, the different
choices could be different links or just plain text, wherein a link is indicated by
the underline "This is a ..." 120, 125 and a plain text have no underlining "This
is a ..." 130. The dots "..." indicates that not all the text is visible, and is an
example of continuos text. The text is typically alpha-numerical.

15 In this example the user selects to continue with pressing on the softkey as is
indicated as Options 135, which brings us to the next layout 140. This layout
shows a menu structure of items; "Home" 145, "Bookmarks" 150, "Select" 155
and "Display options" 160. The text which is inverted in "Display options" 160
20 is selected by 165, which brings us to Fig. 4b and the layout for Display
options 170. In this layout the user has the following choices: Font 175, Size
180, Wrapped text 185 and Continuos text 190. In accordance with the
present invention, the user is allowed to toggle between the continuos length
(as shown in layout 110) and wrapped length, by providing a selectable item
25 of either "Wrapped text" 185 or "Continuos text" 190. Other items are also
shown in this layout, like Font 175 and Size 180, which gives the user further
choices to adopt the text in a preferred manner. Since the information
displayed in layout 110 is continuos and not all information is visible, the user
chooses in this example to select Wrapped text 185.

By selecting Wrapped text the text in layout 110 is changed to be displayed like the text in layout 200. Now, the user is able to read the whole text of the first text "This is a first link" 205 and a part of the second text "This is a" 210. When the user scrolls down the text in the display, by using navigation key 10
5 (Fig. 1), the remaining text from layout 110 is now visible from layout 215 and 220.

Although the invention has been described with respect to a particularly preferred embodiment, it should be appreciated that the invention as defined
10 by the claims extends beyond the particular features of the embodiment described to encompass modifications and variations to the embodiment not necessarily described.

What is claimed is:-